

REMARKS

Favorable reconsideration of this application, in view of the present amendment and in light of the following discussion, is respectfully requested.

Claims 33-34, 36-44 and 46-54 are pending, with claims 51-54 added by the present application. Claims 33, 42 and 51 are independent.

In the Official Action, claims 33-34, 36-44 and 46-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Emerson (U.S. Patent Pub. No. 2003/0006418), McIntosh (U.S. Patent No. 5,684,309) and Biwa (U.S. Patent Pub. No. 2002/0175341).

Claims 51-54 are added to recite Applicant's invention in alternate scope. Support for this amendment is found in Applicant's originally filed specification. No new matter is added.

Briefly recapitulating, claim 33 is directed to

A light emitting diode (LED) comprising:
a first gallium nitride layer;
an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ multi-layer formed over the first gallium nitride layer;
an active layer formed over the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ multi-layer; and
a second gallium nitride layer formed over the active layer,
wherein the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ multi-layer has *a plurality of pits* formed thereon.

Emerson describes a Group III nitride based light emitting diode. The diode includes: a Group III nitride based superlattice; and a Group III nitride based active region on the superlattice comprising at least one quantum well structure. The at least one quantum well structure includes: a first Group III nitride based barrier layer; a Group III nitride based quantum

well layer on the first barrier layer; and a second Group III nitride based barrier layer on the Group III nitride based quantum well layer.

Emerson describes that a superlattice structure 16 may be grown in an atmosphere of nitrogen or other gas, which enables growth of higher-quality InGaN layers in the structure. The term “high quality InGaN layer” means that the InGaN layer has fewer crystal lattice mismatches. (See Emerson, paragraph [0004] and [0006]).

Page 3 of the Official Action notes that Applicant’s previously filed remarks clarified that pit formation requires growth of layers at different temperatures/layer and removal of H₂ during the growth process.¹ The Official Action goes on to point out that Emerson describes growing layers at different temperatures/layer. However, there is no evidence that H₂ gas is removed during the growth process of Emerson. Thus, there is no evidence that the device or method of Emerson explicitly or inherently includes Applicant’s pits or pit formation.

Applicant has considered the remaining references and submits the remaining references do not cure the deficiencies of Emerson. That is, while McIntosh and Biwa describe using hydrogen as a carrier gas, McIntosh and Biwa do not describe removing hydrogen to form pits. As none of the cited art, individually or in combination, disclose or suggest at least the above-noted features of independent claims 33, 42 and 51, Applicant submits the inventions defined by claims 33, 42 and 51, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.²

¹ Specification, paragraph [0039] and [0043].

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael E. Monaco, Reg. No. 52,041, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§ 1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

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² MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest all the claim limitations.